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Relevance scale ☐ ☐ ☐ ☐ ☐**1** [Workshops: HCI and security systems](#)

Andrew S. Patrick, A. Chris Long, Scott Flinn

April 2003 **CHI '03 extended abstracts on Human factors in computing systems CHI '03****Publisher:** ACM PressFull text available: pdf(229.00 KB). Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This workshop will seek to understand the roles and demands placed on users of security systems, and explore design solutions that can assist in making security systems usable and effective. In addition to examining end-users, this workshop will also examine the issues faced by security system developers and operators. The goal of the workshop is to build a network of interested people, share research activities and results, discuss high priority areas for research and development, and explore o ...

Keywords: biometrics, passwords**2** [Practice: 'Affective' computing and emotion recognition systems: the future of biometric surveillance?](#)

Joseph Bullington

September 2005 **Proceedings of the 2nd annual conference on Information security curriculum development InfoSecCD '05****Publisher:** ACM PressFull text available: pdf(85.84 KB). Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper concerns a subtopic of a larger research program called affective computing, referred to as affect recognition (the terms 'affect recognition' and 'emotion recognition' will be used interchangeably in this paper). It is proposed that computer systems based on affect recognition could play an important role in the next generation of biometric surveillance systems. In order to introduce affect recognition and its possible applications to the information security community, the present p ...

Keywords: affective computing, biometrics, surveillance**3** [Real-world applications: papers: An evolutionary keystroke authentication based on ellipsoidal hypothesis space](#)



Jae-Wook Lee, Sung-Soon Choi, Byung-Ro Moon

July 2007 **Proceedings of the 9th annual conference on Genetic and evolutionary computation GECCO '07****Publisher:** ACM PressFull text available: pdf(270.85 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Keystroke authentication is a biometric method utilizing the typing characteristics of users. In this paper, we propose an evolutionary method for stable keystroke authentication. In the method, typing characteristics of users are represented by n -dimensional vectors and an ellipsoidal hypothesis space, which distinguishes a collection of the timing vectors of a user from those of the others, is evolved by a genetic algorithm. A filtering scheme and an adaptation mechanism are also pre ...

Keywords: biometric authentication, identity verification, keystroke biometrics, keystroke dynamics

4 Voice biometrics



Judith A. Markowitz

September 2000 **Communications of the ACM**, Volume 43 Issue 9**Publisher:** ACM PressFull text available: pdf(240.49 KB) html(36.88 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

5 Applications I: Parameter optimization for biometric fingerprint recognition using genetic algorithms



Tobias Scheidat, Andreas Engel, Claus Vielhauer

September 2006 **Proceeding of the 8th workshop on Multimedia and security MM&Sec '06****Publisher:** ACM PressFull text available: pdf(227.65 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we suggest an optimization approach for fingerprint authentication using genetic algorithms. Our application was planned so that it can be used without great effort for different biometric systems. Instead of estimating the required parameters as in the case of some methods, here they are determined with the help of genetic algorithms. Our own test database consists of 1200 fingerprints of 12 persons. For the confirmation of the results, which were found out with this test set, th ...

Keywords: biometrics, fingerprint, genetic algorithms, optimization

6 Poster session and reception: Assessing face and speech consistency for monologue detection in video



H. J. Nock, G. Iyengar, C. Neti

December 2002 **Proceedings of the tenth ACM international conference on Multimedia MULTIMEDIA '02****Publisher:** ACM PressFull text available: pdf(265.81 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper considers schemes for determining which of a set of faces on screen, if any, is producing speech in a video soundtrack. Whilst motivated by the TREC 2002 (Video Retrieval Track) monologue detection task, the schemes are also applicable to voice and face-based biometrics systems, for assessing lip synchronization quality in movie editing and computer animation, and for speaker localization in video. Several approaches are

discussed: two implementations of a generic mutual-information-b ...

7 Network-based approach: Modeling cryptographic properties of voice and voice-based entity authentication

Giovanni Di Crescenzo, Munir Cochinwala, Hyong S. Shim

November 2007 **Proceedings of the 2007 ACM workshop on Digital identity management DIM '07**


Publisher: ACM

Full text available:  pdf(230.76 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Strong and/or multi-factor entity authentication protocols are of crucial importance in building successful identity management architectures. Popular mechanisms to achieve these types of entity authentication are biometrics, and, in particular, voice, for which there are especially interesting business cases in the telecommunication and financial industries, among others. Despite several studies on the suitability of voice within entity authentication protocols, there has been little or no fo ...

Keywords: biometrics, entity authentication, modeling human factors, voice

8 Assurance in life/nation critical endeavors: Biometrics or ... biohazards?

 John Michael Williams


September 2002 **Proceedings of the 2002 workshop on New security paradigms NSPW '02**

Publisher: ACM Press

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IPSE DIXIT Biometrics as an array of deployable technologies presumes an elaborate infrastructure, including underlying science that justifies its claims of detection, classification, identification and authentication of individual human identities; particularly of those who are runaways, illegal immigrants, fugitives, criminals, terrorists, and so on. This will now too often be literally a matter of life and death, both for the public and the individuals identified. The "New Security Paradigm" em ...

9 Identification and authentication when users have multiple accounts

 W. R. Shockley

August 1993 **Proceedings on the 1992-1993 workshop on New security paradigms NSPW '92-93**

Publisher: ACM Press


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10 SCADA systems: vulnerabilities and remediation


John D. Fernandez, Andres E. Fernandez

April 2005 **Journal of Computing Sciences in Colleges**, Volume 20 Issue 4

Publisher: Consortium for Computing Sciences in Colleges

Full text available:  pdf(161.25 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Supervisory Control and Data Acquisition, otherwise known as SCADA, is a system for gathering real time data, controlling processes, and monitoring equipment from remote locations. As more companies are implementing an open SCADA architecture through the Internet to monitor critical infrastructure components such as power plants, oil and gas pipelines, chemical refineries, flood control dams, and waste and water systems, vital systems are becoming increasingly open to attack. This paper provides ...

11 What's happening: What's happeningJanuary 2003 **interactions**, Volume 10 Issue 1**Publisher:** ACM PressFull text available:  pdf(100.72 KB) html(11.58 KB)Additional Information: [full citation](#), [index terms](#)**12** A fuzzy commitment scheme

Ari Juels, Martin Wattenberg

November 1999 **Proceedings of the 6th ACM conference on Computer and communications security CCS '99****Publisher:** ACM PressFull text available:  pdf(966.08 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We combine well-known techniques from the areas of error-correcting codes and cryptography to achieve a new type of cryptographic primitive that we refer to as a fuzzy commitment scheme. Like a conventional cryptographic commitment scheme, our fuzzy commitment scheme is both concealing and binding: it is infeasible for an attacker to learn the committed value, and also for the committer to decommit a value in more than one way. In a convent ...

13 Technical demonstration 1: media understanding and browsing: Online face detection and user authentication


Caroline Mallauran, Jean-Luc Dugelay, Florent Perronnin, Christophe Garcia

November 2005 **Proceedings of the 13th annual ACM international conference on Multimedia MULTIMEDIA '05****Publisher:** ACM PressFull text available:  pdf(387.82 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The ability to verify automatically and with great accuracy the identity of a person has become crucial in everyday life. Biometrics is an emerging topic in the field of signal processing. Our research on biometrics aims at developing a complete framework useful to control access. This technical demo shows the latest image processing techniques for face detection developed at France Telecom and for face recognition developed at Eurécom. Using only one computer and one standard webcam, our b ...

Keywords: biometrics, face detection, face recognition, neural networks**14** Staying connected: Let your fingers do the talking

Meg McGinity

January 2005 **Communications of the ACM**, Volume 48 Issue 1**Publisher:** ACM PressFull text available:  pdf(63.56 KB) html(14.42 KB)Additional Information: [full citation](#), [abstract](#), [index terms](#)

Biometrics is pointing its way into everyday applications. But figuring out how it fits into telecom and wireless services, never mind society, might just get downright touchy.

15 Protocols: Anonymous credentials with biometrically-enforced non-transferability

Russell Impagliazzo, Sara Miner More

October 2003 **Proceedings of the 2003 ACM workshop on Privacy in the electronic society WPES '03****Publisher:** ACM Press

Full text available:  [pdf\(251.66 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

We present a model and protocol for anonymous credentials. Rather than using deterrents to ensure non-transferability, our model uses secure hardware with biometric authentication capabilities. Using the model combining biometric authentication with anonymous credentials in the wallet-with-observer architecture proposed by Bleumer [4], we formalize the requirements of an anonymous credential protocol. In doing so, we define what it means for a protocol to be *strongly subliminal-free*, and s ...

Keywords: anonymous credentials, biometrics, non-transferability, revocation, subliminal-freeness

16 Posters & demos: Multimodal optimizations: can legacy systems defeat them?



John Harper, Donal Sweeney

November 2001 **Proceedings of the 2001 workshop on Perceptive user interfaces PUI '01**

Publisher: ACM Press

Full text available:  [pdf\(3.03 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes several results obtained during the implementation and evaluation of a speech complemented interface to a vehicle monitoring system. A speech complemented interface is one wherein the operations at the interface (keyboard and mouse, for instance) are complemented by operator speech not directly processed by the computer. Such systems from an interface perspective have 'low brow' multimodal characteristics. Typical domains include vehicle tracking applications (taxis, buses, ...

Keywords: legacy systems, mental models, multimodal interfaces, task analysis, user modeling

17 Authentication and authorization: Securing passwords against dictionary attacks



Benny Pinkas, Tomas Sander

November 2002 **Proceedings of the 9th ACM conference on Computer and communications security CCS '02**

Publisher: ACM Press

Full text available:  [pdf\(216.72 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of passwords is a major point of vulnerability in computer security, as passwords are often easy to guess by automated programs running dictionary attacks. Passwords remain the most widely used authentication method despite their well-known security weaknesses. User authentication is clearly a practical problem. From the perspective of a service provider this problem needs to be solved within real-world constraints such as the available hardware and software infrastructures. From a user' ...

18 Security: State based authentication



Saeed A. Rajput, Jihong Chen, Sam Hsu

March 2005 **Proceedings of the 43rd annual Southeast regional conference - Volume 2 ACM-SE 43**

Publisher: ACM Press

Full text available:  [pdf\(593.99 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Access to systems that need protection is usually restricted by asking the user to prove her identity and to authenticate. Combination of user name and password (or PIN) is the most common technique used for this purpose. Unfortunately, user-name/password based authentication is vulnerable to various types of password guessing attacks. Some

techniques of making password guessing very difficult do exist. With these techniques, policies for very strong passwords can be avoided, however, they usual ...

Keywords: access control, attack, authentication, dictionary attack, help-desk, password, password management, rule-based attack, security, syllable attack, unauthorized access, vulnerabilities

19 Access control technology: On classifying access control implementations for distributed systems



Kevin Kane, James C. Browne

June 2006 **Proceedings of the eleventh ACM symposium on Access control models and technologies SACMAT '06**

Publisher: ACM Press

Full text available: pdf(210.74 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a classification of implementations of access control systems based on a lattice taxonomy where the axes are properties of the implementation. The current taxonomy has six axes representing: partitioning of control over sharing of access control credentials, distribution of the state relevant to access control decisions, delity of policy enforcement, the identity resolution mechanism, local versus centralized decisions, and static or adaptive trust management. Analysis of implem ...

Keywords: access control, analysis, classification, distributed systems, taxonomies

20 Modern trends in authentication



David L. Lipton, Harry K. T. Wong

September 1985 **ACM SIGSAC Review**, Volume 3 Issue 2-4

Publisher: ACM Press

Full text available: pdf(517.65 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

Authentication is the process of verifying a person's claim of identity. The designers of secure computer systems have incorporated many techniques of user-validation from law enforcement, from industrial security, and from the financial community. Several methods have also been developed explicitly for use in computer systems. This paper will present an overview of all methods of authentication currently used in computer security. Implementation considerations will also be discussed.

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21 [Location, tracking, nomadic computing: A bluetooth infrastructure for automatic services access in ubiquitous and nomadic computing environments](#)

Massimo Ficco, Maurizio D'Arienzo, Gianni D'Angelo

 October 2007 **Proceedings of the 5th ACM international workshop on Mobility management and wireless access MobiWac '07**

Publisher: ACM

Full text available: pdf(964.58 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The proliferation of mobile devices and wireless technologies pave the ground to new scenarios that attract the interest of service providers and business operators. However, to let mobile users able to receive the same services independently from the context in which they operate, several open issues need to be solved. One of these issues is related to the current levels of security that often require mobile users to exchange secret credentials with the network operators or an authentication ...

Keywords: Bluetooth, authentication, context-aware, ubiquitous computing, wireless LAN access

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Steven J. Greenwald, Marv Schaefer

 September 2002 **Proceedings of the 2002 workshop on New security paradigms NSPW '02**

Publisher: ACM Press

Full text available: pdf(509.28 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)


Our thesis is that biometric and other intertwined technologies will be used to supplement the work of people in the security field. When these technologies are used, we fear that a high degree of misinterpretation and error is likely. Because of this, we need to identify the technical measures required for these systems. This thesis, along with a justification, and proof sketch, was given to the panelists. Five areas of the technology life-cycle were investigated: modeling, implementation, inter ...

23 [Security in embedded systems: Design challenges](#)

Srivaths Ravi, Anand Raghunathan, Paul Kocher, Sunil Hattangady

 August 2004 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 3 Issue

Publisher: ACM Press

Full text available:  pdf(3.67 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Many modern electronic systems---including personal computers, PDAs, cell phones, network routers, smart cards, and networked sensors to name a few---need to access, store, manipulate, or communicate sensitive information, making security a serious concern in their design. Embedded systems, which account for a wide range of products from the electronics, semiconductor, telecommunications, and networking industries, face some of the most demanding security concerns---on the one hand, they are oft ...

Keywords: Embedded systems, architecture, authentication, battery life, cryptographic algorithms, decryption, encryption, hardware design, processing requirements, security, security attacks, security protocols, tamper resistance

24 Identity authentication based on keystroke latencies



Rick Joyce, Gopal Gupta

February 1990 **Communications of the ACM**, Volume 33 Issue 2

Publisher: ACM Press

Full text available:  pdf(823.00 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The variables that help make a handwritten signature a unique human identifier also provide a unique digital signature in the form of a stream of latency periods between keystrokes. This article describes a method of verifying the identity of a user based on such a digital signature, and reports results from trial usage of the system.

25 On-line e-wallet system with decentralized credential keepers

Stig Frode Mjølunes, Chunming Rong

February 2003 **Mobile Networks and Applications**, Volume 8 Issue 1

Publisher: Kluwer Academic Publishers

Full text available:  pdf(240.23 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a generalization of the architecture of an electronic wallet, as first developed in the seminal European research project CAFE. With this model you can leave most of the content of your electronic wallet at the security of your residential electronic keeper, while roaming with your favorite mobile terminals. Emerging mobile handsets with both short range Bluetooth and cellular GPRS communications provide a sufficient communication platform for this electronic wallet architecture. Howe ...

Keywords: digital credentials, e-wallet architecture, mobile commerce, payment protocols, privacy

26 Security: Sound methods and effective tools for model-based security engineering with UML



Jan Jürjens

May 2005 **Proceedings of the 27th international conference on Software engineering ICSE '05 , Proceedings of the 27th international conference on Software engineering ICSE '05**

Publisher: ACM Press, IEEE Computer Society

Full text available:  pdf(205.95 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)




[Publisher Site](#)

Developing security-critical systems is difficult and there are many well-known examples of security weaknesses exploited in practice. Thus a sound methodology supporting

secure systems development is urgently needed. We present an extensible verification framework for verifying UML models for security requirements. In particular, it includes various plugins performing different security analyses on models of the security extension UMLsec of UML. Here, we concentrate on an automated theorem prove ...

Keywords: UML, cryptographic protocol, security, unified modeling language, verification biometric authentication, verification framework

27 Session 2: survivability: Safe and sound: a safety-critical approach to security

 Sacha Brostoff, M. Angela Sasse

September 2001 **Proceedings of the 2001 workshop on New security paradigms NSPW '01**


Publisher: ACM Press

Full text available:  pdf(1.04 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper firstly argues that the design of security applications needs to consider more than technical elements. Since almost all security systems involve human users as well as technology, security should be considered, and designed as, a socio-technical work system. Secondly, we argue that safety-critical systems design has similar goals and issues to security design, and should thus provide a good starting point. Thirdly, we identify Reason's (1990) *Generic Error Modeling System/Basic EI* ...

28 Image and video processing for multimedia surveillance systems: Multimedia surveillance systems

 Rita Cucchiara

November 2005 **Proceedings of the third ACM international workshop on Video surveillance & sensor networks VSSN '05**

Publisher: ACM Press

Full text available:  pdf(372.86 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The integration of video technology and sensor networks constitutes the fundamental infrastructure for new generations of *multimedia surveillance systems*, where many different media streams (audio, video, images, textual data, sensor signals) will concur to provide an automatic analysis of the controlled environment and a real-time interpretation of the scene. New solutions can be devised to enlarge the view of traditional surveillance systems by means of distributed architectures with fi ...

Keywords: multiple cameras, sensor network, survey, video surveillance

29 Trusted products evaluation

 Santosh Chokhani

July 1992 **Communications of the ACM**, Volume 35 Issue 7

Publisher: ACM Press

Full text available:  pdf(4.09 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

Keywords: TCSEC, covert channel analysis, integrity, security, trust

30 Trustworthy systems: Symmetric behavior-based trust: a new paradigm for internet computing

Vivek Haldar, Michael Franz

September 2004 **Proceedings of the 2004 workshop on New security paradigms NSPW '04**

Publisher: ACM Press

Full text available:  [pdf\(76.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Current models of Internet Computing are highly asymmetric - a host protects itself from malicious mobile Java programs, but there is no way to get assurances about the behavior of a program running remotely. The asymmetry stems from a behavior-based security model: hosts ensure conformance to a given security policy by restricting the actions of programs. In contrast, security models that are based on cryptography (including code signing) are inherently symmetric by design but do not match the ...

31 Bioinformatics and ethics: 3D face authentication by mutual coupled 3D and 2D feature extraction

T. H. Lin, W. P. Shih, W. C. Chen, W. Y. Ho

March 2006 **Proceedings of the 44th annual Southeast regional conference ACM-SE 44**

Publisher: ACM Press

Full text available:  [pdf\(249.28 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we present a novel method for automatic 3D face authentication. We introduce a coupled 2D and 3D feature-extraction method to determine the positions of eye sockets. The nose tip is considered as the extreme vertex along the normal directions of eye sockets. Once the nose tip and eye sockets are found, the bilateral symmetrical plane will be determined. The central profile which is on the bilateral symmetrical plane is the foundation for recognizing human face in our method. We us ...

Keywords: automatic feature detection, face authentication, face recognition

32 Columns: Risks to the public in computers and related systems

Peter G. Neumann

November 2003 **ACM SIGSOFT Software Engineering Notes**, Volume 28 Issue 6

Publisher: ACM Press

Full text available:  [pdf\(124.63 KB\)](#) Additional Information: [full citation](#)

33 A smartcard for authentication in WLANs

Marc Loutrel, Pascal Urien, Guy Pujolle

October 2003 **Proceedings of the 2003 IFIP/ACM Latin America conference on Towards a Latin American agenda for network research LANC '03**

Publisher: ACM Press

Full text available:  [pdf\(333.05 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Wireless LANs based on the IEEE 802.11b standard have spread very quickly over the past few years. Nevertheless a lot of security issues remain and stop its deployment in corporations. One of the most important issues is the authentication of a terminal to an Access Point. We propose an interface to integrate the Extensible Authentication Protocol into smartcards and will show that smartcards could constitute the de-facto device for authentication in Wireless LAN as they are for GSM and will ...

Keywords: authentication, smartcard, wireless LANs

34 Security issues for wireless ATM networks

Danai Patiyyoot

January 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue 1



Publisher: ACM Press

Full text available: pdf(1.75 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

To be able to fulfil the need of user in wireless ATM, the system has to acquire features. One of the system features for the wireless ATM is functionality especially the security aspect. There is so far little, if not none, security consideration in the developing of wireless ATM standard. Therefore a wide range of features in security functions is in consideration. This paper tried to define the features of security in wireless ATM networks considering it features from existing fixed ATM network ...

Keywords: security, wireless ATM

35 Invited Discussions: Interacting with identification technology: can it make us more secure?



Jean Scholtz, Jeff Johnson, Ben Shneiderman, Peter Hope-Tindall, Marcus Gosling, Jonathon Phillips, Alan Wexelblatt

April 2002 **CHI '02 extended abstracts on Human factors in computing systems CHI '02**

Publisher: ACM Press

Full text available: pdf(142.76 KB) Additional Information: [full citation](#), [citations](#)

Keywords: biometrics, civil liberties, face recognition, national id card, privacy, security

36 Computer security: A conceptual framework for testing biometric algorithms within operating systems' authentication



Arslan Brömme, Marcel Kronberg, Oliver Ellenbeck, Oliver Kasch

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing SAC '02**

Publisher: ACM Press

Full text available: pdf(675.28 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a conceptual framework for testing the implementation of biometric algorithms within Unix and Windows NT/2000 operating systems' login authentication. To support the analysis and evaluation of biometric algorithms, a data logging module will be used, enabling the collection of quantitative data, e.g. timestamps, biometric raw data, (pre)processed data, and return codes from each run of a biometric authentication. It is shown how biometric algorithms and a data logging module ...

Keywords: biometric authentication, evaluation, operating system, robustness, testing biometric algorithms

37 Applied cryptography: Reusable cryptographic fuzzy extractors



Xavier Boyen

October 2004 **Proceedings of the 11th ACM conference on Computer and communications security CCS '04**

Publisher: ACM Press

Full text available: pdf(251.61 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We show that a number of recent definitions and constructions of fuzzy extractors are not adequate for multiple uses of the same fuzzy secret---a major shortcoming in the case of biometric applications. We propose two particularly stringent security models that

specifically address the case of fuzzy secret reuse, respectively from an outsider and an insider perspective, in what we call a chosen perturbation attack. We characterize the conditions that fuzzy extractors need to satisfy to be sec ...

Keywords: biometric keying, chosen perturbation security, fuzzy extractor, zero storage biometric authentication

38 Consistency enforcement and secure grids: Mesh: secure, lightweight grid
middleware using existing SSH infrastructure

Paul Z. Kolano

June 2007 **Proceedings of the 12th ACM symposium on Access control models and technologies SACMAT '07**

Publisher: ACM Press

Full text available:  pdf(178.90 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Grid computing promises gains in effective computational power, resource utilization, and resource accessibility, but in order to achieve these gains, organizations must deploy grid middleware that, in most cases, does not adhere to fundamental security principles. This paper introduces a new lightweight grid middleware called Mesh, which is based on the addition of a single sign-on capability to the built-in public key authentication mechanism of SSH using system call interposition. The init ...



Keywords: SSH, access control, authentication, authorization, delegation, distributed systems, grids, middleware, security, single sign-on

39 Payments and banking with mobile personal devices

Amir Herzberg

May 2003 **Communications of the ACM**, Volume 46 Issue 5

Publisher: ACM Press

Full text available:  pdf(152.82 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)
 html(31.60 KB)


Mobile devices enable secure, convenient authorization of e-banking, retail payment, brokerage, and other types of transactions.

40 Posters: Towards robust person recognition on handheld devices using face and
speaker identification technologies

Timothy J. Hazen, Eugene Weinstein, Alex Park

November 2003 **Proceedings of the 5th international conference on Multimodal interfaces ICMI '03**

Publisher: ACM Press

Full text available:  pdf(118.84 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Most face and speaker identification techniques are tested on data collected in controlled environments using high quality cameras and microphones. However, the use of these technologies in variable environments and with the help of the inexpensive sound and image capture hardware present in mobile devices presents an additional challenge. In this study, we investigate the application of existing face and speaker identification techniques to a person identification task on a handheld device. The ...

Keywords: face identification, handheld devices, multi-biometric interfaces, speaker identification

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44 Session 2: Email feedback: a policy-based approach to overcoming false positives 

Saket Kaushik, William Winsborough, Duminda Wijesekera, Paul Ammann


November 2005 **Proceedings of the 2005 ACM workshop on Formal methods in security engineering FMSE '05****Publisher:** ACM PressFull text available:  [pdf\(205.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Current email-control mechanisms, though highly effective, are prone to dropping desirable messages. This can be attributed to their coarseness in filtering out undesirable messages from desirable ones. As a result policies to control undesirable messages are often overly permissive. To allow policies to be more restrictive, the transmission mechanism must be made aware of the ways to document a message so that it is acceptable downstream, thus giving the senders a chance of meeting those requi ...

Keywords: constraint logic programming, email/spam control, policy advertisement, policy feedback

45 Reflection as a mechanism for software integrity verification 

Diomidis Spinellis

February 2000 **ACM Transactions on Information and System Security (TISSEC)**, Volume 3 Issue 1**Publisher:** ACM PressFull text available:  [pdf\(85.99 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

The integrity verification of a device's controlling software is an important aspect of many emerging information appliances. We propose the use of reflection, whereby the software is able to examine its own operation, in conjunction with cryptographic hashes as a basis for developing a suitable software verification protocol. For more demanding applications meta-reflective techniques can be used to thwart attacks based on device emulation strategies. We demonstrate how our approach can be ...

Keywords: cryptographic hash function, embedded device, message digest

46 Design considerations: Divide and conquer: the role of trust and assurance in the design of secure socio-technical systems 

Ivan Flechais, Jens Riegelsberger, M. Angela Sasse

September 2005 **Proceedings of the 2005 workshop on New security paradigms NSPW '05****Publisher:** ACM PressFull text available:  [pdf\(2.79 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

In order to be effective, secure systems need to be both correct (i.e. effective when used as intended) and dependable (i.e. actually being used as intended). Given that most secure systems involve people, a strategy for achieving dependable security must address both people and technology. Current research in Human-Computer Interactions in Security (HCISec) aims to increase dependability of the human element by reducing mistakes (e.g. through better user interfaces to security tools). We argue ...

47 Special session 1: machine learning for visual information retrieval: An interactive system for mental face retrieval 

Yuchun Fang, Donald Geman, Nozha Boujemaa

November 2005 **Proceedings of the 7th ACM SIGMM international workshop on Multimedia information retrieval MIR '05**

Publisher: ACM Press

Full text available:  pdf(222.60 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a system to "retrieve" the mental image of a face from a large database using Bayesian inference and relevance feedback. Since the "target image" exists only in the mind of the user, mental image retrieval differs sharply from standard, example-based retrieval and has not been widely studied. In designing the relevance feedback engine, we adopt probabilistic models for the display and answer processes. The answer model is designed to capture properties of human cognition in choosing a ...

48 An interactive codesign environment for domain-specific coprocessors



Patrick Schaumont, Doris Ching, Ingrid Verbauwhede

January 2006 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 11 Issue 1

Publisher: ACM Press

Full text available:  pdf(406.61 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Energy-efficient embedded systems rely on domain-specific coprocessors for dedicated tasks such as baseband processing, video coding, or encryption. We present a language and design environment called GEZEL that can be used for the design, verification and implementation of such coprocessor-based systems. The GEZEL environment creates a platform simulator by combining a hardware simulation kernel with one or more instruction-set simulators. The hardware part of the platform is programmed in GEZEL ...

Keywords: Cosimulation, hardware description language, hardware-software codesign

49 Chip-secured data access: confidential data on untrusted servers



Luc Bouganim, Philippe Pucheral

August 2002 **Proceedings of the 28th international conference on Very Large Data Bases - Volume 28 VLDB '2002**

Publisher: VLDB Endowment

Full text available:  pdf(138.58 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The democratization of ubiquitous computing (access data anywhere, anytime, anyhow), the increasing connection of corporate databases to the Internet and the today's natural resort to Web-hosting companies strongly emphasize the need for data confidentiality. Database servers arouse user's suspicion because no one can fully trust traditional security mechanisms against more and more frequent and malicious attacks and no one can be fully confident on an invisible DBA administering confidential ...


50 Access management for distributed systems: Using trust and risk in role-based access control policies



Nathan Dimmock, András Belokosztolszki, David Eyers, Jean Bacon, Ken Moody

June 2004 **Proceedings of the ninth ACM symposium on Access control models and technologies SACMAT '04**

Publisher: ACM Press

Full text available:  pdf(222.48 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Emerging trust and risk management systems provide a framework for principals to determine whether they will exchange resources, without requiring a complete definition of their credentials and intentions. Most distributed access control architectures have far more rigid policy rules, yet in many respects aim to solve a similar problem. This paper elucidates the similarities between trust management and distributed access control systems by demonstrating how the OASIS access control system and i ...

Keywords: OASIS, SECURE, access control, risk, trust

51 Multilateral security a concept and examples for balanced security



Kai Rannenberg

February 2001 **Proceedings of the 2000 workshop on New security paradigms NSPW '00**

Publisher: ACM Press

Full text available: pdf(1.05 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: GSM, mobile communication, multilateral security, negotiation, privacy, protection, reachability management, security management, simulation study

52 Special session 2: query systems for data retrieval in large personal image and video databases: Human performance measures for video retrieval



Gary Marchionini

October 2006 **Proceedings of the 8th ACM international workshop on Multimedia information retrieval MIR '06**

Publisher: ACM Press

Full text available: pdf(454.14 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we describe the challenges of assessing human performance during video retrieval episodes and describe several measures of human performance that have been used in developing visual surrogates for the Open Video Digital Library (<http://www.open-video.org>). These include two sets of cognitive performance measures that aim to assess human recognition and inference and a set of attitudinal measures that aim to assess user satisfaction with video surrogates.

Keywords: exploratory search, human-computer information retrieval, information interaction, video retrieval

53 Security, privacy and anonymity: Privacy preserving multi-factor authentication with biometrics



Abhilasha Bhargav-Spantzel, Anna Squicciarini, Elisa Bertino

November 2006 **Proceedings of the second ACM workshop on Digital identity management DIM '06**

Publisher: ACM Press

Full text available: pdf(228.45 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

An emerging approach to the problem of reducing the identity theft is represented by the adoption of biometric authentication systems. Such systems however present several challenges, related to privacy, reliability, security of the biometric data. Interoperability is also required among the devices used for the authentication. Moreover, very often biometric authentication in itself is not sufficient as a conclusive proof of identity and has to be complemented with multiple other proofs ...

Keywords: authentication, biometrics, identity theft prevention, privacy

54 Perceptual user interfaces: perceptual intelligence



Alex Pentland

March 2000 **Communications of the ACM**, Volume 43 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(812.65 KB\)](#)
 [html\(33.98 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

55 Session 2: Local spatiotemporal descriptors for visual recognition of spoken phrases 

 Guoying Zhao, Matti Pietikäinen, Abdenour Hadid

September 2007 **Proceedings of the international workshop on Human-centered multimedia HCM '07**


Publisher: ACM Press

Full text available:  [pdf\(614.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Visual speech information plays an important role in speech recognition under noisy conditions or for listeners with hearing impairment. In this paper, we propose local spatiotemporal descriptors to represent and recognize spoken isolated phrases based solely on visual input. Positions of the eyes determined by a robust face and eye detector are used for localizing the mouth regions in face images. Spatiotemporal local binary patterns extracted from these regions are used for describing phrases ...

Keywords: face and eye detection, local spatiotemporal descriptors, mouth region localization, visual speech recognition

56 Risks to the public: Risks to the public 

 Peter G. Neumann


July 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(151.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Edited by Peter G. Neumann (Risks Forum Moderator and Chairman of the ACM Committee on Computers and Public Policy), plus personal contributions by others, as indicated. Opinions expressed are individual rather than organizational, and all of the usual disclaimers apply. We address problems relating to software, hardware, people, and other circumstances relating to computer systems. To economize on space, we include pointers to items in the online Risks Forum: (R i j) denotes RISKS vol i number ...


57 Application specific architectures: Microcoded coprocessor for embedded secure biometric authentication systems 

 Shenglin Yang, Patrick Schaumont, Ingrid Verbauwhede

September 2005 **Proceedings of the 3rd IEEE/ACM/IFIP international conference on Hardware/software codesign and system synthesis CODES+ISSS '05 , Proceedings of the 3rd IEEE/ACM/IFIP international conference on Hardware/software codesign and system synthesis CODES+ISSS '05**

Publisher: ACM Press, IEEE Computer Society

Full text available:  [pdf\(292.29 KB\)](#)

 [Publisher Site](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We design and implement a cryptographic biometric authentication system using a microcoded architecture. The secure properties of the biometric matching process are obtained by means of a fuzzy vault scheme. The algorithm is implemented in a reprogrammable, microcoded coprocessor called FV16. We present the micro-architecture of FV16 as well as a dedicated assembler for this architecture. Our coprocessor can be attached to an ARM processor, and offers a 83-fold cycle count improvement when the f ...

Keywords: cryptographic biometrics, fingerprint verification., fuzzy vault scheme, microcoded coprocessor

58 Network security metrics: Framework for malware resistance metrics



Hanno Langweg

October 2006 **Proceedings of the 2nd ACM workshop on Quality of protection QoP '06**

Publisher: ACM Press

Full text available: pdf(170.29 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We survey existing security metrics in software architecture and software engineering. Metrics are adapted to indicate resistance of an application against local malicious software (malware) attacks. A repository of generic attacks is presented as well as the concept of resistance classes for software products.

Keywords: malware, resistance, software architecture

59 Challenges and constraints to the diffusion of biometrics in information systems



Akhilesh Chandra, Thomas Calderon

December 2005 **Communications of the ACM**, Volume 48 Issue 12

Publisher: ACM Press

Full text available: pdf(95.28 KB) html(30.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Biometrics are a promising technology for improving security, if they can overcome technical and social challenges.

60 Computer security (SEC): Protected transmission of biometric user authentication data for oncard-matching



Ulrich Waldmann, Dirk Scheuermann, Claudia Eckert

March 2004 **Proceedings of the 2004 ACM symposium on Applied computing SAC '04**

Publisher: ACM Press

Full text available: pdf(574.45 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

Since fingerprint data are no secrets but of public nature, the verification data transmitted to a smartcard for oncard-matching need protection by appropriate means in order to assure data origin in the biometric sensor and to prevent bypassing the sensor. For this purpose, the verification data to be transferred to the user smartcard is protected with a cryptographic checksum that is calculated within a separate security module controlled by a tamper resistant card terminal with integrated bio ...

Keywords: authentication, biometrics, cryptographic protocols, data integrity, electronic signature, oncard-matching, smartcards, system security, tamper proof environment

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